APPENDIX I

TAURUS

Structural Loads

Table I-1 specifies the maximum quasi-static limit load factors and angular accelerations expected at the payload interface during various mission phases for both three and four stage Taurus vehicles. These lateral load factors and angular accelerations are generated by motor firing and thrust vectoring. Longitudinal load factors are governed by payload mass and upper stage configuration as shown in Figure I-1 for the Taurus vehicle, and Figure I-2 for the Taurus XL and XLS vehicles

Table I-1
Taurus
Quasi-Static Limit Load Factors and Angular Accelerations
(At Spacecraft Interface Plane)

Mission Segment	Thrust X (g)	Lateral Y (g)	Vertical Z (g)	Roll (rad/s^2)	Pitch (rad/s^2)	Yaw (rad/s^2)
Ground Operations	± 1.5	± 1.7	± 1.7	-	-	-
Flight Operations	Figure I-1,2	± 0.5	± 0.5	± 0.035	± 0.15	± 0.15
On-Orbit Operations	± 0.02	± 0.02	± 0.02	± 0.7	± 0.2	± 0.2

Acoustics

The qualification and acceptance acoustic test levels are given in Table I-2 for the Taurus and Taurus XL vehicles. These levels assume use of the standard Taurus fairing acoustic blanket and a full fairing (i.e., maximum size payload. For the Taurus XLS vehicle, add 2 dB to all levels.

Spacecraft Random Vibration

The random vibration input to the spacecraft and its components is highly sensitive to spacecraft mass and structural configuration. Table I-3 provides the maximum expected random vibration levels at the payload interface ring for a typical 1135 kg (2500 lb) payload on a four stage Taurus or Taurus XL vehicle. Table I-4 provides the corresponding levels for a Taurus XL/S vehicle.

Shock

The maximum expected, launch vehicle produced, shock spectrum at the payload interface is provided in Table I-5.

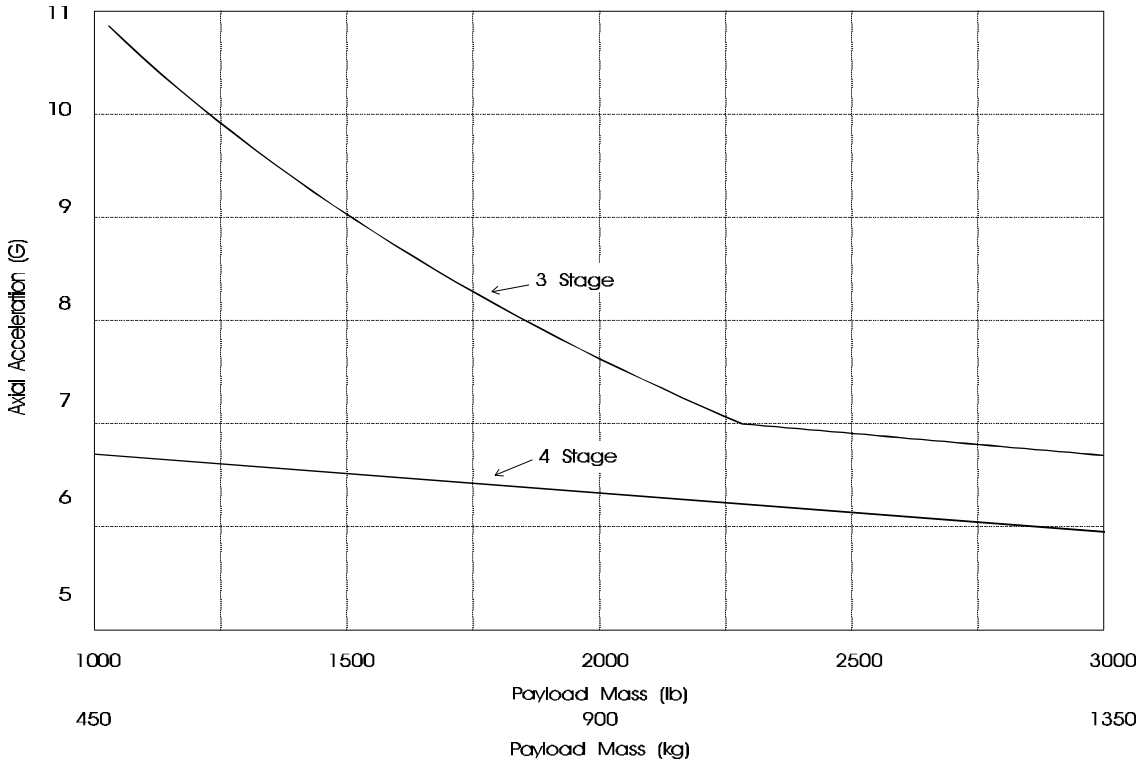

Figure I-1 Taurus Axial Acceleration Loads vs. Payload Mass

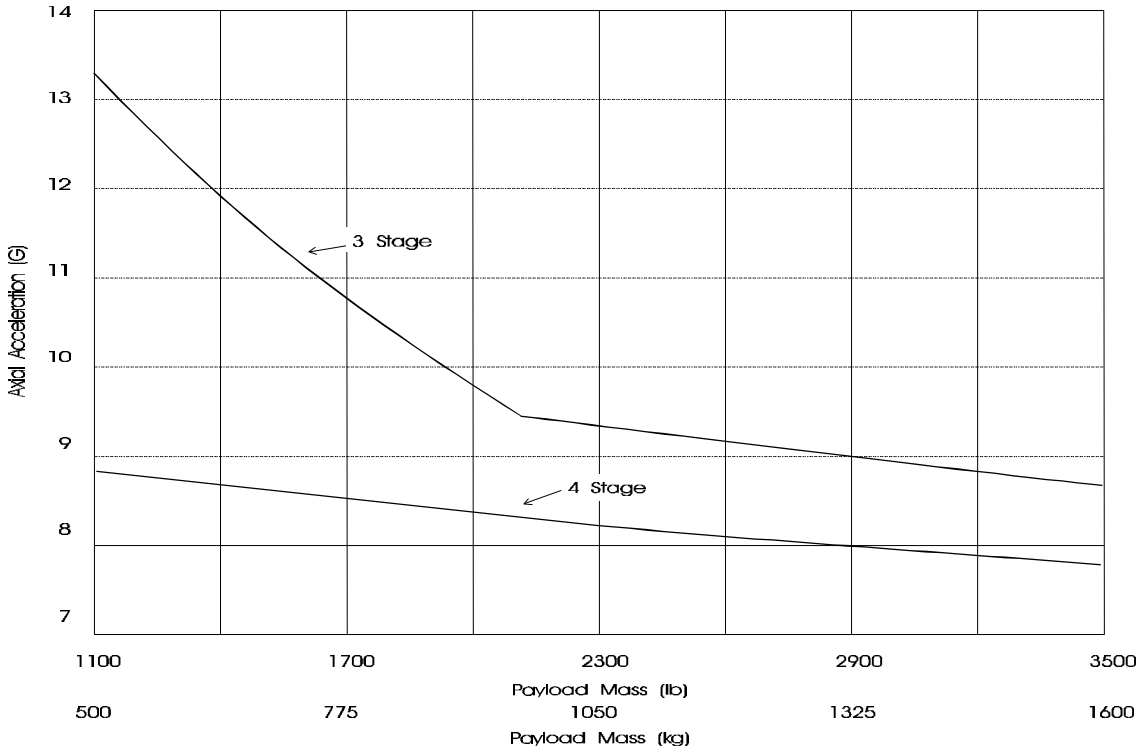

Figure I-2 Taurus XL and XL/S Axial Acceleration Loads vs. Payload Mass

Table I-2
Taurus
Acoustic Test Levels
(Inside Payload Fairing)

One-Third Octave Center Frequency (Hz)	Noise Level (dB) re: .00002 Pa	
	Qualification	Acceptance
25	120.7	117.7
32	123.1	120.1
40	125.3	122.3
50	127.2	124.2
63	128.8	125.8
80	130.9	127.9
100	130.6	127.6
125	130.9	127.9
160	131.4	128.4
200	133.7	130.7
250	135.2	132.2
315	134.0	131.0
400	135.6	132.6
500	136.1	133.1
630	132.9	129.9
800	129.8	126.8
1000	127.7	124.7
1250	125.1	122.1
1600	120.7	117.7
2000	122.4	119.4
2500	116.9	113.9
3150	109.8	106.8
4000	106.8	103.8
5000	105.1	102.1
6300	103.0	100.0
8000	100.7	97.7
10000	99.4	96.4
Overall	144.3	141.3

Table I-3
TAURUS and TAURUS XL
Maximum Expected Random Vibration Level at
Spacecraft Interface

Frequency (Hz)	ASD Level (G^2/Hz)
20	.005
20-100	+5 dB/oct
100-125	.07
125-200	-3.5 dB/oct
200-500	.04
500-1250	-10 dB/oct
1250-2000	.002
Overall Level	5.4 G_{rms}

Table I-4
TAURUS XL/S
Maximum Expected Random Vibration Level at
Spacecraft Interface

Frequency (Hz)	ASD Level (G^2/Hz)
20	.007
20-100	+5 dB/oct
100-125	.1
125-200	-3.5 dB/oct
200-500	.057
500-1250	-10 dB/oct
1250-2000	.0028
Overall Level	6.5 G_{rms}

Table I-5
TAURUS
Launch Vehicle Induced
Pyro Shock Response Spectrum
at Payload Interface
Q=10

Frequency (Hz)	Shock Response Spectrum (G)	
	Qualification	Acceptance
100	140	100
100-2000	+7.4 dB/oct	+7.4 dB/oct
2000-10000	5600	4000